

○ - Do with class

$TA = 6 \cdot B$
 $V = Bh$
 $e^2 \cdot e = e^3 \rightarrow \text{lead into \#3}$

$LA = p \cdot h$
 $TSA = LA + 2B$

Name Key

Date _____ $V = Bh$

Areas and Volumes—Prisms and Cylinders

- ① Find the total area and volume of a cube with an edge of length = 3.

$LA = 36$

$TA = 36 + 2(9)$

$V = e^3$

18

$= 27u^3$

$TA = 54u^2$

2. Find the total area and volume of a cube with an edge of length = 6.

$LA = 24 \cdot 6$

$V = e^3$

$144u^2$

$= 216u^3$

$TA = 144 + 36 \cdot 2 = 216u^2$

- ③ If the volume of a cube is 1000 units³, what is the length of the edge?

$1000 = e^3$

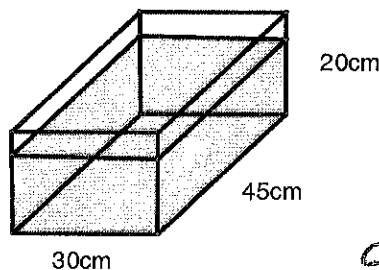
$10u = e$

4. If the volume of a cube is 64 units³, what is the length of the edge?

$64 = e^3$

$4u = e$

- ⑤ A fish tank is filled with water. The dimensions of the water are shown. When a rock is submerged, the water level rises 2cm. What is the volume of the rock?



$V_{w/o} = 30 \cdot 45 \cdot 20 = 27,000 \text{ cm}^3$

$V_{w/} = 30 \cdot 45 \cdot 22 = 29,700 \text{ cm}^3$

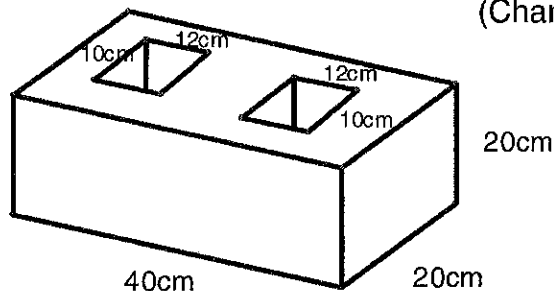
29,700

- 27,000

$V = 2,700 \text{ cm}^3$
 Rock

OR $30 \cdot 45 \cdot 2 = 2,700 \text{ cm}^3$

- ⑥ Find the weight of the cement block shown. Cement weighs 1700 kg/m³?
 (Change to meters 1st)



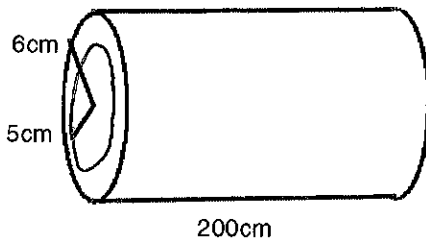
$V_B = 2 V_{hole}$

$V_B = .4 \cdot .2 \cdot .2 = .016$

$V_{hole} = .10 \cdot .12 \cdot .2 = .0024 \times 2 = .0048$

$V_f = .0112 \text{ m}^3 \times \frac{1700 \text{ kg}}{\text{m}^3} = 19.04 \text{ kg}$

7. A pipe is 200cm long and has an inside radius of 5cm and an outside radius of 6cm. How many cubic cm of metal are in the pipe?



$$V_{\text{outer}} - V_{\text{inner}}$$

$$36\pi(200) - 25\pi(200)$$

$$7200\pi - 5000\pi = 2200\pi \text{ cm}^3 \approx 6911.5 \text{ cm}^3$$

OR Area of hole $36\pi - 25\pi$
 11π
 $11\pi \cdot 200 = 2200\pi \text{ cm}^3$

- * 8. Two pipes of the **same length** have diameters 6cm and 8cm. These two pipes are replaced by a single pipe of the **same length**, which has the same capacity as the smaller pipes combined. What should the diameter of the new pipe be?

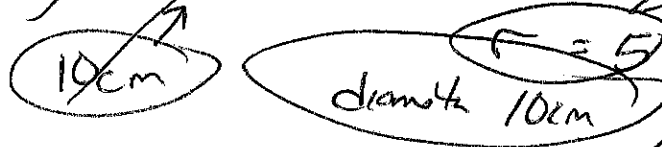
Same Volume

$$V = 36\pi l + 64\pi l$$

$$V = 100\pi l$$

$$V = 9\pi l + 16\pi l$$

$$25\pi l$$



9. Find the volume of the solid to the right.

(The volume of the pyramid is 5cm^3 .)

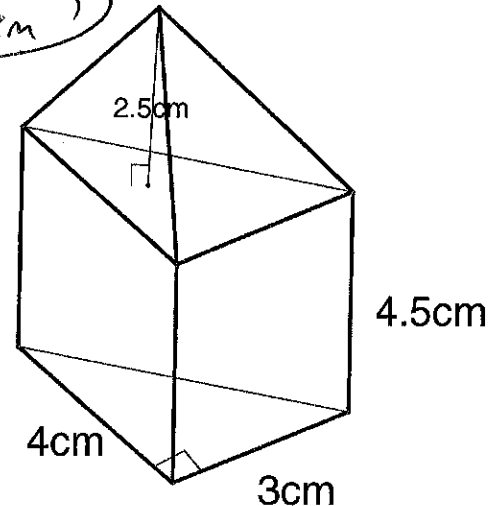
$$V_{\text{pyramid}} + V_{\text{prism}}$$

$$B = \frac{1}{2} \cdot 4 \cdot 3$$

$$5 + 6 \cdot 4 \cdot 5$$

$$27$$

$$32 \text{ cm}^3$$



10. The volume of a triangular prism is $48\sqrt{3}\text{cm}^3$. The base is an equilateral triangle with one side = 8cm. What is the height of the prism?

$$B = \frac{64\sqrt{3}}{4} = 16\sqrt{3}$$

$$48\sqrt{3} = 16\sqrt{3} \cdot h$$

$$3 \text{ cm} = h$$

11. The total surface area of a square prism is 180m^2 . The perimeter of the base is 20m. What is the height of the prism?

$$\div 4 = 5\text{m}$$

$$TA = LA + 2B$$

$$B = 25\text{m}^2$$

$$180 = 20h + 50$$

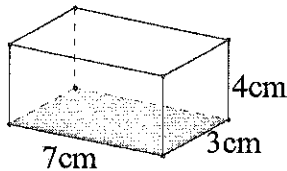
$$130 = 20h$$

$$6.5\text{m} = h$$

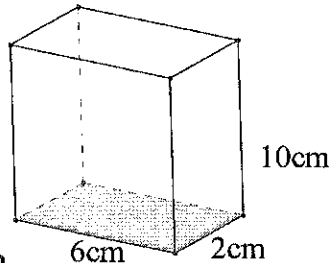
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Date _____

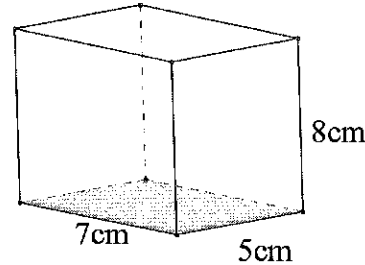
Please find the following: perimeter of the base = p, area of the base = B, LA, TA, and V.



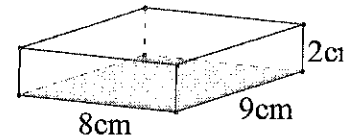
12.
1. $p = 20\text{cm}$
 $B = 21\text{cm}^2$
 $LA = 80\text{cm}^2$
 $TA = 122\text{cm}^2$
 $V = 84\text{cm}^3$



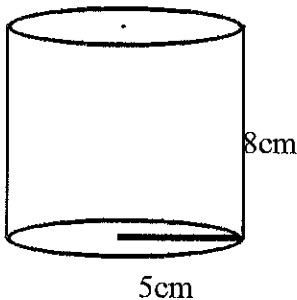
13.
2. $p = 16\text{cm}$
 $B = 12\text{cm}^2$
 $LA = 160\text{cm}^2$
 $TA = 184\text{cm}^2$
 $V = 120\text{cm}^3$



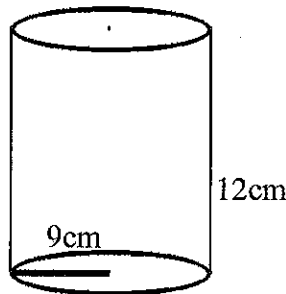
14.
3. $p = 24\text{cm}$
 $B = 35\text{cm}^2$
 $LA = 192\text{cm}^2$
 $TA = 262\text{cm}^2$
 $V = 280\text{cm}^3$



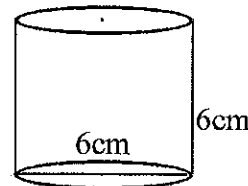
15.
4. $p = 34\text{cm}$
 $B = 72\text{cm}^2$
 $LA = 68\text{cm}^2$
 $TA = 212\text{cm}^2$
 $V = 144\text{cm}^3$



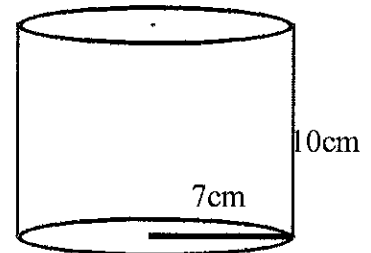
16.
5. $C = 10\pi\text{cm}$
 $B = 25\pi\text{cm}^2$
 $LA = 80\pi\text{cm}^2$
 $TA = 130\pi\text{cm}^2$
 $V = 200\pi\text{cm}^3$



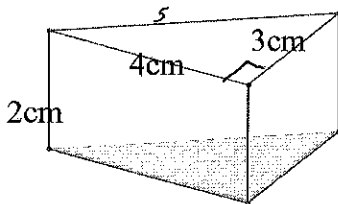
17.
6. $C = 18\pi\text{cm}$
 $B = 81\pi\text{cm}^2$
 $LA = 216\pi\text{cm}^2$
 $TA = 378\pi\text{cm}^2$
 $V = 472\pi\text{cm}^3$



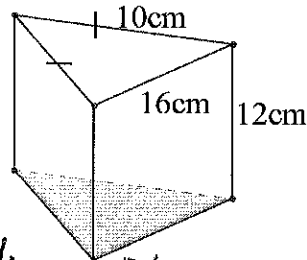
18.
7. $C = 6\pi\text{cm}$
 $B = 9\pi\text{cm}^2$
 $LA = 36\pi\text{cm}^2$
 $TA = 54\pi\text{cm}^2$
 $V = 54\pi\text{cm}^3$



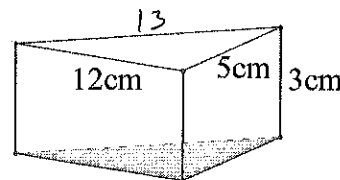
19.
8. $C = 14\pi\text{cm}$
 $B = 49\pi\text{cm}^2$
 $LA = 140\pi\text{cm}^2$
 $TA = 238\pi\text{cm}^2$
 $V = 490\pi\text{cm}^3$



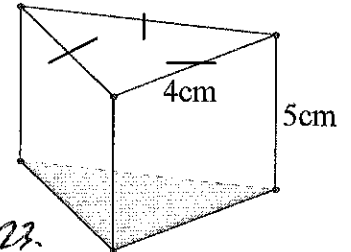
20.
9. (Base is a rt. Δ)
 $p = 12\text{cm}$
 $B = 6\text{cm}^2$
 $LA = 24\text{cm}^2$
 $TA = 36\text{cm}^2$
 $V = 12\text{cm}^3$



21.
10. $p = 36\text{cm}$
 $B = 81\text{cm}^2$
 $LA = 432\text{cm}^2$
 $TA = 528\text{cm}^2$
 $V = 576\text{cm}^3$



22.
11. (Base is a rt. Δ)
 $p = 36\text{cm}$
 $B = 36\text{cm}^2$
 $LA = 90\text{cm}^2$
 $TA = 150\text{cm}^2$
 $V = 90\text{cm}^3$



23.
12. $p = 12\text{cm}$
 $B = 4\sqrt{3}\text{cm}^2$
 $LA = 60\text{cm}^2$
 $TA = (60 + 8\sqrt{3})\text{cm}^2 \approx 73.9\text{cm}^2$
 $V = 20\sqrt{3}\text{cm}^3 \approx 34.6\text{cm}^3$

